Fiscal Year 2021 Competition Information Sheet - New Climate Monitoring Approaches and Products for Areas of Climate Risk

Program Name

Modeling, Analysis, Predictions, and Projections (MAPP) Program.

Program Mission

The mission of the Modeling, Analysis, Predictions, and Projections (MAPP) Program is to enhance the Nation's capability to predict variability and change in Earth's climate system. The MAPP Program focuses on the coupling, integration, and application of Earth System models and analyses across NOAA, among partner agencies, and with the external research community. Primary objectives include: 1) improving Earth System models; 2) supporting an integrated Earth System analysis capability; 3) improving methodologies for global to regional scale climate analysis, predictions, and projections; and 4) developing climate modeling capabilities and applications relevant to decision makers based on climate analyses, predictions, and projections. MAPP sits within the Earth System Science and Modeling Division (ESSM) of the NOAA Office of Oceanic and Atmospheric Research (OAR) Climate Program Office (CPO).

Focus for FY 2021

New Climate Monitoring Approaches and Products for Areas of Climate Risk

Funding for FY2021

Pending the availability of funds in FY 2021, the MAPP program anticipates a funding allocation of up to $1,500,000 for this competition.

Proposals may be for up to three years, up to $150,000/year. A total of approximately 7-10 projects may be funded.

Competition Information

Variability and change in the climate system leads to impacts, sometimes extreme or cascading, that require accurate characterization in a historical context. Observational, modeling, and analytical techniques can be combined to provide a cohesive view of climate change and variability over time. These climate monitoring efforts offer increased understanding of climate impacts, benchmarking of contemporary events and conditions against the historical record, and a cohesive picture of the state of the climate system for scientific analysis and public understanding and planning. In cases where data frequency timescales match or exceed the rate of change in the climate system, climate monitoring may even provide early warning of significant events developing in the climate system. Effective monitoring of the climate system is a cornerstone of NOAA’s strategic plan: the “integration of research and analysis;

observations and monitoring; and environmental modeling" is described as a key element of NOAA's science mission.[1]

In FY 2021, the MAPP Program is soliciting proposals to advance climate monitoring. This effort builds on NOAA's leadership in providing climate monitoring products to the public. NOAA's Fisheries, Ocean, Satellite, and Weather services as well as its Laboratories and Cooperative Institutes provide a wide range of critical climate information to the public, leveraging the agency's extensive in-situ and remote data holdings, modeling capabilities, communication and dissemination expertise, and scientific leadership. This solicitation also builds on a long history of the Climate Program Office's support for building capabilities undergirding climate monitoring and new climate monitoring products.

Proposals focused on developing new or experimental monitoring products (i.e., with relevance to the areas described above), or developing new climate monitoring approaches (e.g., DA-based or other methods) are encouraged. Work should leverage new or under-utilized observational datasets, modeling or assimilation-based techniques, and/or reanalysis data (for example, the newly-released 20th Century Reanalysis, Version 3[2] or operational climate analyses). Approaches utilizing machine learning or other artificial intelligence techniques, or able to address data that is sparse or unstructured are welcome. Investigators should focus proposals on climate monitoring efforts that provide new monitoring products relevant to high-priority climate risk areas around which the Climate Program Office is organizing some of its activities[3]. These include extreme heat, hydroclimate and water resources with a focus on pluvial conditions, and coastal inundation. Proposals may target broad phenomena and data for monitoring efforts relevant to the priority climate risk areas listed above. Proposals could (but are not required to) be specific to near-term foci under CPO's risk area activities, which includes water in the Great Lakes region under the water resources effort, urban heat under the extreme heat effort, and East and Gulf Coast inundation under the coastal inundation effort.

Proposals should have a strong process focus, be grounded in physical drivers of variability and change, account for complex and multi-variate linkages within and between climate system components, and take into account the utility of monitoring products to stakeholders through documented criteria describing thresholds, metrics, and categorical criteria needed by stakeholders who make decisions related to the areas of extreme heat, water resources, and coastal inundation. Products that may be able to fill information gaps in the National Climate Assessment[4,5] or the USGCRP Indicators Platform[6] are encouraged. Monitoring on different timescales is welcome, although products on seasonal, monthly, or sub-monthly timescales are particularly encouraged. Monitoring efforts focused on large regional or national scales are welcome; smaller spatial scales are not within program scope.

Proposals are required to involve a NOAA investigator or collaborator and to demonstrate relevance of intended new products to one or more NOAA Line Offices. Investigators are encouraged to include in their project the use of climate-quality NOAA data including in-situ or remotely-sensed observational products and can focus on issues of data inhomogeneity on temporal and spatial dimensions. Proposals

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[1] https://www.performance.noaa.gov/wp-content/uploads/NOAA_NGSP.pdf
[2] https://www.psl.noaa.gov/data/20thC_Rean/
[3] https://cpo.noaa.gov/News/ArtMID/7875/ArticleID/1945/NOAA's-Climate-Program-Office-launches-Climate-Risk-Areas-Initiative
[4] https://nca2018.globalchange.gov/
[5] https://science2017.globalchange.gov/
[6] https://www.globalchange.gov/browse/indicators/catalog

should include evidence that the observational dataset(s) to be used are available and suited for the intended monitoring application, and describe how the product will be evaluated and validated. Development of new datasets is outside the scope of the competition.

Proposals potentially resulting in a new monitoring product that may be transferred into real-time or operational maintenance, for example at the National Centers for Environmental Information, must include a transition plan describing the plan for development and transfer as well as operational uptake and maintenance. Proposals aiming for transition of research products should ensure that any data streams, codes, or other techniques and inputs are developed or co-developed to be portable and optimized for operational workflows. Please see NOAA Administrative Order NAO 216-105B[7] (section 3.06) for information on preparing a transition plan as well as a description of research "readiness levels," where lower levels correspond to non-transition applied upstream research and higher levels correspond to research that may result in a new product with possibility of continuing maintenance or provision in an operational sense. A transition plan should be included in the proposal as an addendum and will not count against the overall page limit, although the plan should not exceed three pages in length.

Individual projects that address the development of monitoring products or capabilities relevant to one or more of the above research areas may be funded at a level of up to $150K/year for up to three years. Proposed work plans should account for time spent on participation in a potential Task Force[8] that may be constituted of the investigators funded as a result of this solicitation. In addition to project primary investigators, postdoctoral fellows and graduate students are also welcome to participate in Task Force activities. Task Forces enable collaboration between funded investigators via monthly teleconferences and through constructive collaborative activities. In the past, Task Forces have produced fact sheets, knowledge statements, collaborative analysis products, and group journal articles; and have organized meeting sessions, special collections, or other activities.

Competition contact information: Daniel Barrie (daniel.barrie@noaa.gov)

Proposers interested in working with the NCEI Climatic Analysis & Synthesis Branch as an operational partner may contact Russel Vose (russell.vose@noaa.gov)

General Guidelines for FY 2021 MAPP proposal submission:

- Principal investigators submitting a proposal in response to this MAPP Announcement are required to follow the Letters of Intent (LOI) and Proposal preparation and submission guidelines described in the Climate Program Office FY 2021 Notice of Federal Funding Opportunity announcement.
- Investigators are strongly encouraged to submit an LOI prior to developing and submitting a full proposal using the FY21 MAPP Letter of Intent submission form[9]; investigators unable to submit via the form should email their LOI to oar.cpo.mapp@noaa.gov. Investigators will be notified by

[7] http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_216/NAO%20216-105B%20UNSEC%20Signed.pdf

[8] https://cpo.noaa.gov/Meet-the-Divisions/Earth-System-Science-and-Modeling/MAPP/MAPP-Task-Forces

[9] https://docs.google.com/forms/d/e/1FAIpQLScRoVx6frPdzy1uiEQ0xfYsWiuDtvTxk76w8KruHqE0bsx6XA/viewform

the MAPP Program Competition Manager as to whether a full proposal is encouraged based on the LOI within four weeks of the LOI due date.
- Proposals must clearly identify in their summary which MAPP competition is being targeted (only one competition may be targeted by a given proposal).
- Administrative questions regarding the Notice of Federal Funding Opportunity (e.g. proposal formatting or submission guidelines) should be directed to Diane Brown (diane.brown@noaa.gov).

A webinar will be offered to potential applicants for background on the MAPP program and this solicitation soon after publication of this announcement. For Information on webinar timing and registration procedures please check the MAPP website[10]; prior to when the webinar is held, potential applicants can also sign-up to receive an email notification[11].

Diversity and Inclusion

MAPP recognizes that it has a particular and unique opportunity and responsibility to support NOAA's and the community's commitment to diversity and inclusion by taking an intentional step that encourages program applicants to consider diversity and inclusion as part of their scientific projects. MAPP supports the goal of increasing the inclusion of underrepresented groups in NOAA-relevant modeling science. This action has the potential to make an impact on not only the diversity and inclusion in science at NOAA, but also beyond the agency. In your proposal, we encourage you to think about how your project can broaden the participation of underrepresented groups (e.g., gender, race, ethnicity, disability, geographic, etc.). Examples could include, but are not limited to, full participation of women, persons with disabilities, and other underrepresented minorities in science, technology, engineering, and mathematics (STEM). Opportunities that may engage students or early career scientists from underrepresented groups at different or earlier ages (e.g., even secondary) in the context of your proposed research are encouraged.

Data Archiving and Computational Resources

Computational Resources

Computational resources on NOAA's high-performance computing platforms may be requested for research sponsored as a result of this solicitation. Proposals should indicate the availability of alternative computing resources should NOAA resources not be available for the project. Proposers who choose to request computational allocations on NOAA's platforms must include in their proposal a request describing the computational resources and data storage required, as well as a description of how they will port their methodology to the NOAA platforms. Proposers must submit an HPC Request Form[12] with their proposal in order to apply for computational resources.

Questions regarding the use of NOAA's high-performance computing platforms should be directed to Dan Barrie (daniel.barrie@noaa.gov).

Data Management Guidance

[10] https://cpo.noaa.gov/Meet-the-Divisions/Earth-System-Science-and-Modeling/MAPP

[11] https://docs.google.com/forms/d/e/1FAIpQLSdIHdaDe3TjRGivO9OqdgPSKnEIN6dfHiwBZz9Efm2YMOd33A/viewform

[12] https://cpo.noaa.gov/Portals/0/MAPP_FY21_HPC_Request_Form.docx

The MAPP Program requires that all products and deliverables produced via solicitation will reside in the open access / open source domain, freely available to the public.
Public access to grant/contract-produced data will be enabled in one of the following ways (select one):

- Funding recipients are planning to submit data to NOAA National Centers for Environmental Information (NCEI), which will provide public access and archiving[13]. Point of Contact for NCEI is Nancy Ritchey (Nancy.Ritchey@noaa.gov)

- Data are to be submitted to an International Council for Science (ICSU) World Data System facility: https://www.icsu-wds.org/community/membership/regular-members)

- An existing publicly accessible online data server at the funded institution is to be used to host these data (describe in proposal).

- An existing publicly accessible online "cloud" service is to be used to host the data (described in the proposal).

The Competition Manager (above) is the responsible NOAA Official for questions regarding this guidance and for verifying accessibility of data produced by funding recipients.

[13] NCEI supports the creation of adequate metadata and data ingest into long term repository holdings using tools such as Send2NCEI (www.nodc.noaa.gov/s2n), for small volume, one-time only data collections) and Advanced Tracking and Resource tool for Archive Collections or ATRAC (https://www.ncdc.noaa.gov/atrac/index.html), for recurring and/or large volume data collections).